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LIGHTFOOT, ELENA TSOY				
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JAMES A. LEISTRA, NED E. CIPOLLINI,  
WAYDE R. SCHMIDT, JARED B. HERTZBERG,  
CHI H. PAIK, THOMAS D. JARVI,  
TIMOTHY W. PATTERSON, and SONIA TULYANI

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Appeal 2009-012424  
Application 10/698,659  
Technology Center 1700

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Before BRADLEY R. GARRIS, CHUNG K. PAK, and  
PETER F. KRATZ, *Administrative Patent Judges*.

KRATZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1-3, 5-12, 14, 24-27, 29, 37, and 38. We have jurisdiction pursuant to 35 U.S.C. § 6.

Appellants' claimed invention is directed to a method of making a membrane electrode assembly including an anode, cathode, and membrane located between these electrodes. A peroxide decomposition catalyst is deposited on a layer located between the cathode and membrane or on a layer located between the anode and the membrane, wherein the layer has a porosity less than or equal to 20 percent.

Claim 1 is illustrative and reproduced below:

1. A method for making membrane electrode assembly, comprising the steps of:

providing a membrane electrode assembly comprising an anode including a hydrogen oxidation catalyst; a cathode; and a membrane disposed between said anode and said cathode; and

depositing a peroxide decomposition catalyst in at least one position selected from the group consisting of a layer between said anode and said membrane and a layer between said cathode and said membrane, wherein said peroxide decomposition catalyst has selectivity when exposed to hydrogen peroxide toward reactions which form benign products from said hydrogen peroxide, and wherein said layer has a porosity of less than or equal to 20% and is less porous than said anode and said cathode.

The Examiner relies on the following prior art references as evidence in rejecting the appealed claims:

Rajendran	US 5,981,097	Nov. 9, 1999
Asukabe et al.	US 6,335,112 B1	Jan. 1, 2002
Wessel et al.	US 2003/0008196 A1	Jan. 9, 2003
Menjak et al.	US 2003/0059664 A1	Mar. 27, 2003
De Leceta et al	US 6,685,806 B1	Feb. 3, 2004
Nakagawa et al.	JP 07024315 A	Jan. 27, 1995

The following grounds of rejection are maintained by the Examiner.

Claims 1-3, 5-9, 11, 12, 14, 24-27, 29, 37, and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wessel in view of De Leceta. Claims 1-3, 5-9, 11, 12, 14, 24-27, 29, 37, and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Asukabe in view of Wessel and De Leceta. Claims 1-3, 5-9, 11, 12, 14, 24-27, 29, 37, and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Menjak in view of Wessel and De Leceta. Claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Wessel in view of De Leceta or Asukabe in view of Wessel and De Leceta or Menjak in view of Wessel and De Leceta, each further in view of Nakagawa.

We reverse the stated rejections for substantially the reasons argued by Appellants (App. Br. 9-10 and Reply Br. 1-2).

In the stated rejections, the Examiner acknowledges that each of Wessel, Asukabe in view of Wessel, and Menjak in view of Wessel do not teach the porosity of the layer including the peroxide decomposition catalyst as required by all of the appealed claims (see independent claims 1 and 25).

The Examiner does not rely on Nakagawa, as additionally employed in rejecting dependent claim 10, for teaching or suggesting the claimed porosity feature.

Rather, the Examiner turns to De Leceta for allegedly providing a teaching or suggestion of providing a membrane electrode assembly with a cation exchange membrane electrode layer with a porosity that decreases in a direction toward the membrane such that the electrode would have a final porosity less than 40 percent (Ans. 4-5). In this regard, the Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to form the electrode having the peroxide

decomposition catalyst layer of each of Wessel, Asukabe in view of Wessel, or Menjak in view of Wessel, with a porosity of 20 percent or less in light of the alleged teachings of De Leceta for forming an electrode with less than 40 percent final porosity (Ans. 5). This position is taken by the Examiner regardless of the teaching of De Leceta that the electrode layer has a general porosity of 40 to 70 percent (Ans. 4-5; De Leceta, abst. , col. 6, ll. 50-55, and Example 5).

Appellants argue that all of the Examiner's rejections are premised on a flawed interpretation of De Leceta concerning De Leceta's alleged electrode porosity teaching. This is because, according to Appellants, De Leceta discloses forming electrodes having porosity between 40 and 70 percent, with a porosity gradient that decreases in the membrane direction while retaining a porosity within the aforementioned porosity limits (App. Br. 9; Reply Br. 1-2).

Appellants have raised a dispositive issue common to all of the Examiner's rejections by this argument, which we resolve in Appellants' favor.

In this regard, we agree with Appellants that De Leceta does not teach forming an electrode layer adjacent an electrode containing a peroxide decomposition containing catalyst that has a porosity of 20 percent or less.

As indicated above and as rendered beyond dispute from a review of the Examiner's Answer in its entirety, all of the Examiner's obviousness rejections are bottomed on the Examiner's assertions that De Leceta allegedly teaches/suggests an electrode having the claimed porosity and, consequently, suggests the claimed porosity limitation for a peroxide decomposition catalyst-containing layer of Wessel and/or the such a layer

said to be suggested by the other applied reference combinations with Wessel.

The Examiner correctly observes that De Leceta describes the aforementioned electrode porosity as being between forty and seventy percent, not less than 20 percent porosity as claimed here (Ans. 4). However, the Examiner speculates that a simple calculation would show that the final porosity is less than forty weight percent for the electrode in De Leceta as evinced by using some of the reported information from Example 5 of De Leceta (Ans. 4-5).

In this regard, the Examiner has not carried the burden of presenting a prima facie case of obviousness by furnishing all the necessary calculations to establish that the Examiner's interpretation of Example 5 of De Leceta, including the reported porosity gradient, provides for an electrode layer with a final porosity of at about 20 weight percent or less. For instance, the thickness of one hundred and fifty microns that the Examiner refers to in Example 5 of De Leceta represents the cation exchange membrane (CEM) thickness, not the thickness of an electrode layer (Ans. 5; De Leceta, col. 14, ll. 21-25 and 45-48). The Examiner does not furnish calculations that establish limits for the electrode layer thickness made in accordance with the Example 5 procedure of De Leceta to evince that the general porosity for that layer, forty-five percent, as reported by De Leceta, may be inconstant with the other data provided (Ans. 5, De Leceta, col. 14, ll. 49-60).

Much more, the Examiner has not conclusively proven that the clear disclosure as to the electrode general porosity, including the forty-five percent value for Example 5, as provided by De Leceta, is somehow wrong

and that the Examiner is correct as to the electrode porosity that is disclosed by De Leceta.

Thus, the Examiner has not established that the applied prior art teaches or suggests the porosity requirement of the appealed claims; that is, the twenty percent or less porosity of a layer containing peroxide decomposition catalyst, the layer located on either side of a membrane, which membrane is located between the anode or cathode.

On this record, we cannot sustain the obviousness rejections maintained by the Examiner.

#### CONCLUSION/ORDER

The Examiner's decision to reject the appealed claims is reversed.

REVERSED

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